

CLAIMS

What is claimed is:

1. A plate pair, comprising:
a first plate having a first opening through a first plate portion thereof;
a second plate having a second opening through a second plate portion thereof, the second opening being larger than the first opening; and
braze material securing the first plate portion to the second plate portion with the first and second openings in substantial alignment with each other.
2. The plate pair of claim 1 wherein a perimeter of the first opening does not overlap with a perimeter of the second opening.
3. The plate pair of claim 1 wherein at least the first opening is circular.
4. The plate pair of claim 3 wherein an opening formed by the aligned first and second openings has an effective diameter equal to that of the first opening.
5. The plate pair of claim 1 wherein at least one of the first and second openings is oval.
6. The plate pair of claim 1 wherein at least one of the first and second openings is elliptical.
7. The plate pair of claim 1 wherein at least one of the first and second openings is triangular.
8. The plate pair of claim 1 wherein at least one of the first and second openings is rectangular.

9. The plate pair of claim 1 wherein the first opening and the second opening each have a different shape
10. The plate pair of claim 1 wherein at least one of the first and second openings is multi-sided.
11. The plate pair of claim 1 wherein the first opening and the second opening are not concentric.
12. The plate pair of claim 1 including a fastener having a shaft passing through the openings.
13. The plate pair of claim 1 wherein the plate pairs form a heat exchanger, the first plate and second plates each having substantially planar spaced apart central portions that are surrounded by peripheral edge portions, the peripheral edge portions of the first and second plates including substantially planar peripheral flange sections that are brazed together and through which the first and second openings are formed, a fluid flow chamber having inlet and outlet openings being defined between the spaced apart central portions.
14. The plate pair of claim 13 wherein a plurality of first openings are formed through the first plate flange section and a plurality of the second openings are formed through the second plate flange section in alignment with corresponding ones of the first openings, forming a plurality of mounting openings.
15. A method of forming a plate pair, comprising:
 - (a) providing a first plate having a first opening through a substantially planar portion thereof;

(b) providing a second plate having a second opening through a substantially planar portion thereof, the second opening being larger than the first opening, at least one of the first plate and second plate being covered with a brazing material; and

(c) oven brazing the first plate and the second plate together with the first plate planar portion abutting against the second plate planar portion and the first and second openings substantially in alignment with each other.

16. The method of claim 15 wherein a perimeter of the first opening does not overlap with a perimeter of the second opening.

17. The method of claim 15 wherein the aligned first and second openings form a mounting opening having an effective diameter equal to that of the first opening.

18. The method of claim 15 wherein the first and second openings are substantially the same shape, the shape being selected from the group consisting of circular, oval, elliptical, triangular and rectangular.

19. The method of claim 15 wherein the first opening and second opening are dimensioned such that the minimum distance between a perimeter of the second opening and a perimeter of the first opening is at least equal to the thickness of the second plate.

20. The method of claim 15 including forming at least one of the first and second plates by stamping, and forming the first opening and the second opening by punching through the first and second plates, respectively.